

**ABSTRACT**

The present invention provides a means to implement amplitude and phase modulation digitally and directly at an RF frequency that benefits from high output power using non-linear amplifiers. This is accomplished by the combination  
5 of two constant amplitude phase varying vectors. A reference oscillator produces a carrier signal, which is supplied to two digital delay lines composed of a sequence of delay banks. The delay lines are controlled by lookup tables that are updated by the vector control circuit used to determine the delay of each digital delay line. The delay of the lines are set in such a way as to produce two vectors with the desired  
10 phase shift that, when summed together, produce a vector with the desired phase and amplitude characteristics.